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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/BR99/00079 <b>(22) International Filing Date:</b> 21 September 1999 (21.09.99)  <b>(30) Priority Data:</b> PI 9803946-6      21 September 1998 (21.09.98)      BR PI 9901906-0      19 April 1999 (19.04.99)      BR  <b>(71) Applicant (for all designated States except US):</b> IBF INDÚSTRIA BRASILEIRA DE FILMES S/A [BR/BR]; Rua Lauro Muller, 116 - 10º andar, Botafogo, CEP-22290-160 Rio de Janeiro, RJ (BR).  <b>(72) Inventors; and</b> <b>(75) Inventors/Applicants (for US only):</b> ARIAS, Andre Luiz [BR/BR]; Rua Lauro Muller, 116 - 10º andar, Botafogo, CEP-22290-160 Rio de Janeiro, RJ (BR). ARIAS, Luiz Nei [BR/BR]; Rua Lauro Muller, 116 - 10º andar, Botafogo, CEP-22290-160 Rio de Janeiro, RJ (BR). ARIAS, Marjorie [BR/BR]; Rua Lauro Muller, 116 - 10º andar, Botafogo, CEP-22290-160 Rio de Janeiro, RJ (BR). PROVENZANO, Mario, Italo [BR/BR]; Rua Lauro Muller, 116 - 10º andar, Botafogo, CEP-22290-160 Rio de Janeiro, RJ (BR).		<b>(81) Designated States:</b> AE, AL, AM, AT, AU, AZ, BA, BB, BG, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the</i> <i>claims and to be republished in the event of the receipt of</i> <i>amendments.</i>
<b>(54) Title:</b> RADIATION SENSITIVE COATING COMPOSITION USEFUL FOR LITHOGRAPHIC PRINTING PLATES AND THE LIKE  <b>(57) Abstract</b>  The invention relates to a composition, which is primarily energy sensitive in the near infrared and infrared region, and which comprises a dual polymer system, an infrared absorbing material that absorbs at the desired wavelength, an acid generating compound, and an acid stabilizing compound. The composition may be applied to the proper substrate and is useful to provide offset lithographic printing plates, color proofing film or photoresist.		

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**Title: "RADIATION SENSITIVE COATING COMPOSITION USEFUL FOR LITHOGRAPHIC PRINTING PLATES AND THE LIKE"**

**Field of the Invention**

The invention relates to new radiation sensitive compositions, suitable for coating substrates, particularly lithographic printing plates, color proofing films or photoresist.

**Background of the Art**

Compositions used in heat sensitive lithographic printing plates are well known in the art.

Compositions for coating lithographic plates comprising a phenolic resin-developer complex and a compound forming a complex with the phenolic resin were taught in the art.

It is an object of the present invention to provide new radiation sensitive compositions, specially suitable for use on printing plates, color proofing films and photoresist.

It is another object of the present invention the products manufactured with the use of radiation sensitive compositions of the present invention.

It is another object of the present invention to provide a process for manufacturing offset lithographic printing plates, color proofing films and related products using the new compositions of the present invention.

It still refers to said compositions for preparing the products mentioned herein.

**Summary of the Invention**

The novel radiation sensitive composition is comprised of: 1) a dual polymer binder system, 2) an infrared absorbing compound, 3) an acid generating compound and, optionally, 4) a stabilizing acid.

## D tailed Description of the Invention

The radiation sensitive compositions of the present invention for coating substrates comprise 1) a dual polymer binder system, 2) an infrared absorbing compound, 3) an acid generating compound, and 4) a stabilizing acid.

### 5 1. Dual polymer binder system

The first polymer of the binder system is a condensation product of phenol, o-chlorophenol, o-, m- or p-cresol, p-hydroxy benzoic acid, 2-naphthol or other monohydroxy aromatic monomer with an aldehyde such as formaldehyde, acetaldehyde, fural, benzaldehyde, or any other aliphatic or aromatic aldehyde. This polymer is preferred to have a molecular weight in the range from 2,000 to 80,000, more preferably in the range from 4,000 to 40,000, and most preferably in the range from 7,000 to 20,000.

The second polymer of the system is the condensation product of catechol, resorcinol, hydroquinone, bisphenol A, bisphenol B, trihydroxybenzene, or other di- or polyhydroxy aromatic compound, and methylolated analogs thereof, with an aldehyde such as formaldehyde, acetaldehyde, fural, benzaldehyde, or any other aliphatic or aromatic aldehyde. This polymer is preferred to have a molecular weight in the range from 150 to 15,000, more preferably in the range from 400 to 10,000, and most preferably in the range from 600 to 4,000.

### 2. Infrared absorbing compound

20 The infrared absorber may be either a dye or insoluble material such as carbon black. Preferred dyes are those derived from classes that include, but not limited to pyridyl, quinoliny, benzoxazolyl, thiazolyl, benzothiazolyl, oxazolyl and selenazolyl. Carbon black is useful in that it is a panchromatic absorber and functions well with energy sources in the full spectrum of infrared useful for the application of imaging coating films, and is inexpensive and readily available. This region begins in the near infrared (NIR) at 750 nm and goes up to 1200 nm. The disadvantage of carbon black is the inability to participate in image differentiation. Dyes, in comparison, are just beginning to arise as commercial products, and are very expensive. They must be carefully selected so that the absorption  $\lambda_{\max}$  (lambda maximum) is closely matched with the output wavelength of the laser used on the image setter. Dyes will advantageously enhance the differentiation between the image and non-image areas created when the laser images in the medium being employed.

### 3. Acid generating compound

The acid generating compound is advantageously selected from the various onium salt classes. These include, but are not limited to sulfonium, sulfoxonium, arsonium, iodonium, diazonium, bromonium, selenonium and phosphonium. Generally, any compound  
5 capable of liberating a strong inorganic acid upon the onium salt being decomposed by heat, will be functional in this composition. The anion, which determines the released free acid, includes, but is not limited to chloride, bisulfate, hexafluoroantimonate, hexafluorophosphate, tetrafluoroborate, methane sulfonate and mesitylene sulfonate. More specific examples in-  
10 clude diphenyliodonium hexafluorophosphate, 3-methoxy-4-diazodiphenylamine hexafluoro-  
phosphate.

### 4. Stabilizing acid

The optional stabilizing acid compound is added to enhance the shelf life of the coated medium prior to being imaged. Carboxylic acids are preferred. More preferred  
15 are aromatic acids. Examples of such acids are benzoic acid and substitutes thereof and naphthoic acid and substitutes thereof.

The coating composition is dissolved in a suitable solvent(s). Examples of such solvents include, but are not limited to: 1-methoxy-2-ethanol, 1-methoxy-2-propanol, acetone, methyl ethyl ketone, diisobutyl ketone, methyl isobutyl ketone, n-propanol, isopro-  
panol, tetrahydrofuran, butyrolactone, and methyl lactate.

20 The coating components may be added to various solid levels based upon the technique used to apply the coating to the substrate being coated. Therefore, the ratios of components may be the same, but the percentages could differ. The percentage ranges inherent to the amounts of each of the coating components will therefore be described herein as a percentage of the total solids.

25 This composition may be applied to different substrates for different purposes. Essentially, it can be used for manufacturing lithographic printing plates and in color proofing films or photoresist.

If applied to a textured and anodized aluminum surface, the coated product may be used as a lithographic or offset printing plate. If the composition is applied to a sup-  
30 port, e.g. a polyester support, it may be advantageously used as a color proofing film.

When used for the manufacture of a printing plate, the composition is primarily sensitive to energy in the infrared (IR) region. There is essentially no sensitivity in the visible region of the spectrum. However, depending upon the specific infrared absorber selected, the composition may be made to respond in the ultraviolet region (UV). This would afford the additional advantage of being both IR and UV sensitive.

As to the processing of printing plates, the printing plates are preferably placed on an image setter for radiation and imaging. Such image setters may output at any wavelength. Presently there are two common wavelengths used. An array of laser diodes emitting at 830 nm is commercially available. Such a device is manufactured and sold by Creo, Vancouver, Canada. A YAG laser outputting at 1064 nm, manufactured and sold by Gerber, a division of Barco, Gent, Belgium, is also in the market. Each wavelength has its own advantages and disadvantages. Both, however, are capable of producing acceptable images according to the specific manufacturing mode or way used. Digitized information is then used for modulating the laser output.

The energy is directed to the plate surface where an energy transfer mechanism occurs. In the coating, the laser dye or infrared absorbing medium absorbs the energy emitted by the laser and releases that energy as heat. Such heat in turn causes the degradation of the acid generator held within the coating, which results in the release of a strong acid. Such acid in turn causes a reaction to occur between the polymers. The reaction may be a photo-hardening reaction that makes this a "write-the-image" approach. In such a process, the area struck with energy becomes the image while the remainder of the coating is removed in the developing process. On the other hand, if the reaction causes a photo-solubilization, it is a so-called "write-the-background" approach. Here the portion of the coating struck with energy is removed in the developing process, and the unaffected area becomes the image.

Depending upon the wavelength used for imaging, and the specific composition, the energy provided by the laser may be sufficient to adequately initiate the reaction and take it to completion. In instances when the energy is not sufficient, additional energy is required, which is typically applied in the form of a pre-heating step. Pre-heating may be accomplished by running the plate through an oven after being imaged and prior to being developed. The temperature is typically in the range from 80° to 150°C. A most common temperature is about 110°C. The time required at said temperature is usually between 30 and 200 seconds, more commonly about 1 minute.

By adjusting the formulation, it is also possible to use the heating step to cause the image to reverse. For instance, a plate imaged in the "write-the-background" mode would be expected to have the coating removed from the background when processed, as would be expected from the processing of a positive plate. When heated, it is possible to cause the image to reverse, such that the area exposed to laser radiation and now heated becomes the image. Therefore, the portion of the coating exposed to laser radiation becomes the image when heated, and that portion of the coating not exposed to laser radiation becomes the soluble upon development. The ability to cause this reversal is determined by the ratio of the two polymers used.

All coating compositions described herein are developed using a developer composition, which is usually completely aqueous and has a high pH. Developers typically used for positive plates are most useful. The developer takes advantage of the differentiation created with the exposure to remove the background coating and allow the image to remain. At this point the image is capable of some performance on printing machine, particularly if the required number of impressions is low. For performance enhancing, the coating may be baked. The baking step completes the cross-linking of the polymers and results in an image capable of providing several thousand times more images than without baking. The temperature range is from about 180° to 260°C. Most commonly 230°C is used. The time in this step usually ranges from 1 to 10 minutes. Most commonly 4 - 5 minutes is used. Baking is usually performed within a conveyor oven such as those sold by Wisconsin Oven.

Typical compositions within the scope of the invention are as follows:

#### 1. Write-the-background mode

dual polymer binder,

	* polyphenolic	50 - 95%
25	* polyhydric	5.0 - 40%
	infrared absorber	0.1 - 12%
	acid generator	0.1 - 12%
	stabilizing acid (optional)	0.1 - 10%

#### 2. Write-the-image mode



	dual polymer binder,	
	* polyphenolic	5 - 95%
	* polyhydric	10 - 90%
	infrared absorber	0.1 - 12%
5	acid generator	0.1 - 15%
	stabilizing acid (optional)	0.1 - 10%

More particular compositions in the scope of the present invention include:

#### 1A. Write-the-background mode

		COMPOSITION A	COMPOSITION B
10	dual polymer binder,		
	* polyphenolic	50 - 90%	60 - 95%
	* polyhydric	5 - 35%	10 - 40%
	infrared absorber	0.5 - 12%	0.1 - 10%
	acid generator	0.5 - 12%	0.1 - 10%
15	stabilizing acid	0.1 - 10%	0.1 - 10%

#### 2A. Write-the-image mode

		COMPOSITION A'	COMPOSITION B'
	dual polymer binder,		
	* polyphenolic	5 - 40%	60 - 95%
20	* polyhydric	40 - 90%	10 - 40%
	infrared absorber	0.5 - 12%	0.1 - 10%
	acid generator	1.0 - 15%	0.1 - 10%

stabilizing acid

0.1 - 10%

For the "write-the-background" approach, according to a more specific and particular embodiment of the invention, the polyphenolic polymer (first polymer) is preferably used in the range from about 50% to about 90%, more preferably from about 55% to about 80% and most preferably from about 60% to about 75%. The polyhydric polymer (second polymer) is preferably used in the range from about 5% to about 35%, more preferably from about 8% to about 25%, and most preferably from about 10% to about 18%. The infrared absorbing compound is preferably used in the range from about 0.5% to about 12%, more preferably from about 1% to about 10%, and most preferably from about 2% to about 7%. The photoacid generating compound is preferably used in the range from about 0.5% to about 12%, more preferably from about 1% to about 10%, and most preferably from about 2% to about 7%. The stabilizing acid (optional component) is preferably used in the range from about 0.1% to about 10%, more preferably from about 0.5% to about 7%, and most preferably from about 1% to about 5%.

For the "write-the-image" approach, according to a more specific and particular embodiment of the invention, the polyphenolic polymer (first polymer) is preferably used in the range from about 5% to about 40%, more preferably from about 10% to about 35%, and most preferably from about 15% to about 30%. The polyhydric polymer (second polymer) is preferably used in the range from about 40% to about 90%, more preferably from about 45% to about 80%, and most preferably from about 50% to about 70%. The infrared absorbing compound is preferably used in the range from about 0.5% to about 12%, more preferably from about 1% to about 10%, and most preferably from about 2% to about 7%. The photoacid generating compound is preferably used in the range from about 1% to about 15%, more preferably from about 2% to about 12%, and most preferably from about 4% to about 10%. The stabilizing acid compound (optional component) is preferably used in the range from about 0.1% to about 10%, more preferably from about 0.5% to about 7%, and most preferably from about 1% to about 5%.

The coating components are dissolved in the desired solvent system. The coating solution is applied to the substrate of choice. The coating is applied so as to have a dry coating weight in the range from about 1.5 g/m<sup>2</sup> to about 3.0 g/m<sup>2</sup>, more preferably from about 1.8 g/m<sup>2</sup> to about 2.7 g/m<sup>2</sup>, and most preferably from about 2.0 g/m<sup>2</sup> to about 2.5 g/m<sup>2</sup>. The coating is dried under conditions that will effectively remove all solvent, but no so ag-

gressive as to cause some degradation of the acid generator or reaction of the polymers with themselves or with each other.

The following non-limiting examples illustrate the invention:

#### Example 1

5           A coating solution was prepared by dissolving 6.6 g of Bakelite 744 (a novolak resin sold by Bakelite), 13.4 g of HRJ 11482 resin (a polyhydric resin sold by Schenectady), 1.0 g of laser dye 830A (sold by ADS, Montreal, Canada), 1.6 g of diphenyliodonium hexafluorophosphate, and 0.4 g of naphthoic acid in 58 g of 1-methoxy-2-propanol and 19 g of methyl ethyl ketone. An aluminum substrate which has been degreased, electrochemically  
10   grained, anodized, and made hydrophilic with a polyvinyl phosphonic acid treatment, as is well known to one skilled in the art, was coated with the above composition. When properly dried, the plate was placed on a Creo Trendsetter image setter, imaging is done in the "write-the-image" mode using 200 mJ/cm<sup>2</sup> of energy at 830 nm. The plate was developed through a processing machine which was charged with IBF-PD positive developer. The de-  
15   veloped plate was observed to have a very strong positive image with good resolution. Based upon an UGRA scale, the microlines were 8/10 and the halftone dot resolution was 2 - 98. Under standard printing conditions, the plate was observed to print about 20,000 good impressions.

#### Example 2

20           Another plate was prepared as described in example 1 except that after imaging, and prior to development, the plate was given a heat treatment for one minute at 110°C. The plate was similarly developed in a positive developer. Again a positive image was observed. The image was observed to be more intense. The microline resolution was 4/6 and the halftone dot resolution was 0.5 - 99.5. Under standard printing conditions, the  
25   plate was observed to print about 70,000 good impressions.

#### Example 3

          Another plate was prepared exactly as described in example 2. After development, the plate was baked for five minutes at 230°C. Under standard printing conditions, the plate was observed to print about 20,000 good impressions.

30

#### Example 4

A coating solution was prepared by dissolving 13.6 g of Bakelite 744 (a novolak resin sold by Bakelite), 3.0 g of HRJ 11482 resin (a polyhydric resin sold by Schenectady), 2.4 g of carbon black, 0.6 g of 3-methoxy-4-diazodiphenylamine hexafluorophosphate, and 0.4 g of benzoic acid in 81.6 g of 1-methoxy-2-propanol and 20 g of methyl ethyl ketone.

5 An aluminum substrate which has been degreased, electrochemically grained, anodized, and made hydrophilic with a polyvinyl phosphonic acid treatment, as is well known to one skilled in the art, is coated with the above composition. When properly dried, the plate was placed on a Creo Trendsetter image setter. Imaging was done in the "write-the-background" mode using 200 mJ/cm<sup>2</sup> of energy at 830 nm. The plate is developed through a processing  
10 machine which was charged with IBF-PD positive developer. The developed plate was observed to have a reverse image. The portion of the coating which was imaged is now the background. The image resolution was however very good. Based upon an UGRA scale, the microlines were 10/8 and the halftone dot resolution was 2 - 98. Under standard printing conditions, the plate was observed to print about 25,000 good impressions.

#### 15 Example 5

Another plate was prepared as described in example 4 except that after imaging, and prior to development, the plate was given a heat treatment for one minute at 110°C. The plate was similarly developed in a positive developer. This time a positive image was observed. Heating has caused the image to reverse. The image was observed to  
20 be more intense and have better resolution than the reversed counterpart. The microline resolution was 4/6 and the halftone dot resolution was 0.5 - 99. Under standard printing conditions, the plate was observed to print about 95,000 good impressions.

#### Example 6

Another plate was prepared exactly as described in example 5. After development,  
25 the plate was baked for five minutes at 230°C. Under standard printing conditions, the plate was observed to print about 3,400,000 good impressions.

#### Example 7

A coating solution was prepared by dissolving 17 g of Bakelite 744 (a novolak resin sold by Bakelite), 3.8 g of HRJ 11482 resin (a polyhydric resin sold by Schenectady),  
30 1.0 g of carbon black, and 0.8 g of 3-methoxy-4-diazo-2-diphenylamine hexafluorophosphate, and 58.6 g of 1-methoxy-2-propanol and 19.2 g of methyl ethyl ketone. An aluminum

substrate which has been degreased, electrochemically grained, anodized, and made hydrophilic with a polyvinyl phosphonic acid treatment, as is well known to one skilled in the art, was coated with the above composition. When properly dried, the plate was placed on a Crescent 30 image setter and imaging was done in the "write-the-image" mode using 275 mJ/cm<sup>2</sup> of energy at 1064 nm. The plate was developed through a processing machine which was charged with IBF-PD positive developer. The developed plate was observed to have a very strong positive image with good resolution. Based upon an UGRA scale, the microlines were 6/10 and the halftone dot resolution was 1 - 98. Under standard printing conditions, the plate was observed to print about 23,000 good impressions.

#### 10 Example 8

Another plate was prepared as described in example 7 except that after imaging, and prior to development, the plate was given a heat treatment for one minute at 110°C. The plate was similarly developed in a positive developer. Again a positive image was observed. The image was observed to be more intense. The microline resolution was 4/6 and the halftone dot resolution was 0.5 - 99.5. Under standard printing conditions, the plate was observed to print about 85,000 good impressions.

#### Example 9

Another plate was prepared exactly as described in example 8. After development, the plate was baked for five minutes at 230°C. Under standard printing conditions, the plate was observed to print about 2,350,000 good impressions.

#### Example 10

A coating solution was prepared by dissolving 15.8 g of Bakelite 744 (a novolak resin sold by Bakelite), 5.0 g of HRJ 11482 resin (a polyhydric resin sold by Schenectady), 1.6 g of carbon black, 0.2 g of laser dye 1060 A (manufactured and sold by ADS), and 0.6 g of diphenyliodonium hexafluorophosphate, in 81.6 g of 1-methoxy-2-propanol and 20 g of methyl ethyl ketone. An aluminum substrate which has been degreased, electrochemically grained, anodized, and made hydrophilic with a polyvinyl phosphonic acid treatment, as is well known to one skilled in the art, was coated with the above composition. When properly dried, the plate was placed on a Crescent 30 image setter. Imaging was done in the "write-the-background" mode using 275 mJ/cm<sup>2</sup> of energy at 1064 nm. The plate was developed through a processing machine which was charged with IBF-PD positive developer.

The developed plate was observed to have a reverse image. The portion of the coating which was imaged is now the background. The image resolution was however very good. Based upon an UGRA scale, the microlines were 10/6 and the halftone dot resolution was 2 - 98. Under standard printing conditions, the plate was observed to print about 20,000 good impressions.

#### Example 11

Another plate was prepared as described in example 10 except that after imaging, and prior to development, the plate was given a heat treatment for one minute at 110°C. The plate was similarly developed in a positive developer. This time a positive image was observed. Heating has caused the image to reverse. The image was observed to be more intense and have better resolution than the reversed counterpart. The microline resolution was 4/8 and the halftone dot resolution was 1 - 99. Under standard printing conditions, the plate was observed to print about 80,000 good impressions.

#### Example 12

Another plate was prepared exactly as described in example 11. After development, the plate was baked for five minutes at 230°C. Under standard printing conditions, the plate was observed to print about 2,800,000 good impressions.

### Claims

1. A radiation sensitive composition, wherein the composition comprises: 1) a dual polymer binder system, 2) an infrared absorbing compound, 3) an acid generating compound and, optionally, 4) a stabilizing acid.
2. A composition according to claim 1, wherein the dual polymer binder system comprises a first polymer comprised of a condensation product of phenol, o-chlorophenol, o-, m- or p-cresol, p-hydroxy benzoic acid, 2-naphthol or other monohydroxy aromatic monomer with an aldehyde such as formaldehyde, acetaldehyde, fural, benzaldehyde, or any other aliphatic or aromatic aldehyde;
- and a second polymer comprised of the condensation product of catechol, resorcinol, hydroquinone, bisphenol A, bisphenol B, trihydroxybenzene, or other di- or polyhydroxy aromatic compound, and methylolated analogs thereof, with an aldehyde such as formaldehyde, acetaldehyde, fural, benzaldehyde, or any other aliphatic or aromatic aldehyde.
3. A composition according to claim 1, wherein the first polymer has a molecular weight in the range from 2,000 to 80,000, more preferably in the range from 4,000 to 40,000, and most preferably in the range from 7,000 to 20,000; and the second polymer has a molecular weight in the range from 150 to 15,000, more preferably in the range from 400 to 10,000, and most preferably in the range from 600 to 4,000.
4. A composition according to claim 1, wherein the infrared absorbing compound is a dye or insoluble material such as carbon black.
5. A composition according to claim 1, wherein the infrared absorbing compound is preferably comprised of dyes derived from classes including pyridyl, quinoliny, benzoxazolyl, thiazolyl, benzothiazolyl, oxazolyl and selenazolyl.
6. A composition according to claim 5, wherein the acid generating compound is an onium salt.

7. A composition according to claim 6, wherein the onium salt comprises sulfonium, sulfoxonium, arsonium, iodonium, diazonium, bromonium, selenonium and phosphonium.

5 8. A composition according to claim 6 or 7, wherein the anion, which determines the released free acid, includes chloride, bisulfate, hexafluoroantimonate, hexafluorophosphate, tetrafluoroborate, methane sulfonate and mesitylene sulfonate.

9. A composition according to claim 6 or 7, wherein the onium salt is diphenyliodonium hexafluorophosphate or 3-methoxy-4-diazodiphenylamine hexafluorophosphate.

10 10. A composition according to claim 1, wherein the stabilizing acid is a carboxylic acid.

11. A composition according to claim 10, wherein the stabilizing acid is an aromatic carboxylic acid.

12. A composition according to claim 11, wherein the stabilizing acid is a benzoic acid or a substitute thereof or a naphthoic acid or a substitute thereof.

15 13. A composition according to any of the preceding claims, wherein it is useful for coating substrates, particularly lithographic printing plates and in color proofing films or photoresist.

14. A composition according to any of the preceding claims, wherein it is applied to a lithographic printing plate and said plate is subjected to a heat treatment after imaging and prior to development.

15. A composition according to any of the preceding claims, wherein it is applied to a lithographic printing plate and said plate is subjected to cure after development.

16. A composition according to any of the preceding claims, wherein it is dissolved in an appropriate solvent system.

25 17. A composition according to any of the preceding claims, wherein it is applied to provide a coating having a dry weight in the range from 1.5 g/m<sup>2</sup> to 3.0 g/m<sup>2</sup>.

18. A composition according to any of the preceding claims, wherein it is applied to provide a coating on a textured and anodized aluminum substrate or on a polyester substrate.



19. A composition, wherein the composition is as described in the description and examples.

20. A composition according to any of the preceding claims, wherein it comprises the use as in the write-the-background mode and as in the write-the-image mode:

5           **1. Write-the-background mode**

dual polymer binder,

\* polyphenolic                      50 - 95%

\* polyhydric                         5.0 - 40%

infrared absorber                   0.1 - 12%

10            acid generator                   0.1 - 12%

stabilizing acid (optional)        0.1 - 10%

**2. Write-the-image mode**

dual polymer binder,

\* polyphenolic                      5 - 95%

15            \* polyhydric                         10 - 90%

infrared absorber                   0.1 - 12%

acid generator                       0.1 - 15%

stabilizing acid (optional)        0.1 - 10%

20            21. A composition according to any of the preceding claims, wherein it comprises the use as in the write-the-background mode and as in the write-the-image mode:

**1A. Write-the-background mode**

**COMPOSITION A    COMPOSITION B**

dual polymer binder,

	* polyphenolic	50 - 90%	60 - 95%
	* polyhydric	5 - 35%	10 - 40%
	infrared absorber	0.5 - 12%	0.1 - 10%
	acid generator	0.5 - 12%	0.1 - 10%
5	stabilizing acid	0.1 - 10%	0.1 - 10%

**2A. Write-the-image mode****COMPOSITION A' COMPOSITION B'**

	dual polymer binder,		
	* polyphenolic	5 - 40%	60 - 95%
10	* polyhydric	40 - 90%	10 - 40%
	infrared absorber	0.5 - 12%	0.1 - 10%
	acid generator	1.0 - 15%	0.1 - 10%
	stabilizing acid	0.1 - 10%	0.1 - 10%

22. The use of a radiation sensitive composition as defined in any of the  
 15 claims 1 to 21, wherein it is used for coating substrates, particularly lithographic printing plates and in color proofing films or photoresist applications.

23. A lithographic printing plate, wherein it comprises a coating prepared from  
 a composition according to any claims 1 - 21.

24. A process for printing or image development, wherein said process com-  
 20 prises the use of a composition as defined in any of claims 1 - 21, for forming a coating upon a support and developing an image from the support coated with said composition.

25. A process for printing or image development, wherein said process is as  
 described in the description and examples.

# INTERNATIONAL SEARCH REPORT

International application No.

PCT/BR 99/00079

## A. CLASSIFICATION OF SUBJECT MATTER

IPC7: G03F 7/004, C08G 4/00, C08G 8/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: C08G, G03F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

QUESTEL: EDOC, WPIL, JAPIO

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5601961 A (KAZUHIKO NAKAYAMA ET AL), 11 February 1997 (11.02.97), column 2, line 66 - column 3, line 47; column 10, line 49 - line 59; column 11, line 8 - line 26 --	1,4,6,7,13, 16,22-24
Y	EP 0501433 A1 (E.I. DU PONT DE NEMOURS AND COMPANY), 2 Sept 1992 (02.09.92), page 2, line 8 - line 10; page 6, line 40 - page 7, line 14; page 16, line 51 - page 17, line 5 --	1,4,6,7,13, 16-22
A	US 4943511 A (RICHARD M. LAZARUS ET AL), 24 July 1990 (24.07.90), claim 1 -- -----	1-25

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

\* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

27 January 2000

Name and mailing address of the International Searching Authority  
European Patent Office P.B. 5818 Patentlaan 2  
NL-2280 HV Rijswijk  
Tel(+31-70)340-2040, Tx 31 651 epo nl,  
Fax(+31-70)340-3016

Date of mailing of the international search report

22 02. 2000

Authorized officer

BENGT CHRISTENSSON/ELY  
Telephone No.

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

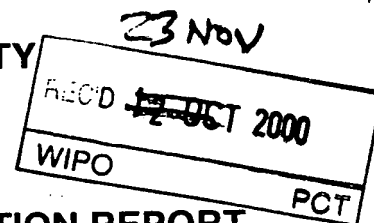
02/12/99

International application No.  
PCT/BR 99/00079

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5601961 A	11/02/97	JP 7271024 A	20/10/95
EP 0501433 A1	02/09/92	CA 2061877 A	29/08/92
		CN 1065468 A	21/10/92
		DE 69219502 D,T	11/12/97
		JP 5093003 A	16/04/93
		US 5886101 A	23/03/99
US 4943511 A	24/07/90	AT 94661 T	15/10/93
		AU 3127689 A	05/10/89
		DE 68909084 D,T	13/01/94
		DK 155289 A	01/10/89
		EP 0336605 A,B	11/10/89
		IL 89632 A	31/01/93
		JP 2010348 A	16/01/90
		JP 2042766 C	09/04/96
		JP 7078627 B	23/08/95
		KR 9401550 B	24/02/94
		NO 891062 A	02/10/89
		SG 43594 A,G	14/10/94
		US 4996122 A	26/02/91

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)





Applicant's or agent's file reference PE-3695		See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) <b>FOR FURTHER ACTION</b>	
International application No. PCT/BR99/00079	International filing date (day/month/year) 21/09/1999	Priority date (day/month/year) 21/09/1998	
International Patent Classification (IPC) or national classification and IPC G03F7/004			
Applicant IBF IND STRIA BRASILEIRA DE FILMES S/A et al.			

- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 4 sheets, including this cover sheet.  
  
☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 5 sheets.

- This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  20/04/2000	Date of completion of this report  10.10.2000
Name and mailing address of the international preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer  Randez Garcia, F  Telephone No. +49 89 2399 2234 

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/BR99/00079

## I. Basis of the report

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

### Description, pages:

1,3-11	as originally filed			
2	as received on	19/09/2000	with letter of	18/09/2000

### Claims, No.:

1-6	as originally filed			
7-22	as received on	19/09/2000	with letter of	18/09/2000

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Yes:	Claims	1-22
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-22
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-22
	No:	Claims	

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/BR99/00079

---

**2. Citations and explanations**

**see separate sheet**

**Re Item V**

**Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

- 1). None of the documents mentioned in the International Search Report discloses a radiation sensitive composition as the one claimed in claim 1.

Thus, the composition according to US-A-5,601,961 does not comprise an infrared absorbing compound nor a stabilising agent.

EP-A-0 501 433 teaches radiation-sensitive compositions which contain a dual polymer binder system, ethylenically-unsaturated monomer and a photoinitiator system. However, it does not disclose acid generating compounds. Carbon black is mentioned therein as a suitable pigment, but its properties as infrared absorber are not indicated.

- 2). For those reasons, the composition according to claim 1, its use according to claim 15, a lithographic printing plate according to claim 16 and a process for printing or image development according to claim 17, have not been anticipated by the prior art documents considered.
- 3). Moreover, the idea of using an IR-absorber to increase the temperature of the exposed regions and, thus, produce the release of acid in those regions, has not been suggested in the considered prior art documents. Therefore, an inventive step can be recognised in the subject-matter of claims 1 and 15 to 17.
- 4). The remaining claims are particular embodiments of the inventive ideas contained in claims 1 and 15 to 17.



PC

## REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

Receiving Office use only

PCT/BR 99 / 00 079

International Filing Date  
1 SET 1999 21-9- 99INPI, BRAZIL - PCT INTERNATIONAL APPLICATION  
Name of receiving Office and "PCT International Application"Applicant's or agent's file reference  
(if desired) (12 characters maximum) PE-3695

## Box No. I TITLE OF INVENTION

"Radiation sensitive coating composition useful for lithographic printing plates and the like"

## Box No. II APPLICANT

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

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22290-160 - Rio de Janeiro - RJ  
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☐ This person is also inventor.

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(21) 541-0288

Teleprinter No.

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BR

State (that is, country) of residence:

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This person is applicant for the purposes of:

☐ all designated States☒ all designated States except the United States of America☐ the United States of America only☐ the States indicated in the Supplemental Box

## Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

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Rua Lauro Muller, 116 - 10º andar  
Botafogo  
22290-160 - Rio de Janeiro - RJ  
Brazil

This person is:

☐ applicant only☒ applicant and inventor☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

BR

State (that is, country) of residence:

BR

This person is applicant for the purposes of:

☐ all designated States☐ all designated States except the United States of America☒ the United States of America only☐ the States indicated in the Supplemental Box☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.

## Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:

☒ agent☐ common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

DANNEMANN, SIEMSEN, BIGLER & IPANEMA MOREIRA  
Caixa Postal 2142  
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Facsimile No.

(21) 553-1811  
553.1812

Teleprinter No.

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

## Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

*If none of the following sub-boxes is used, this sheet should not be included in the request.*

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

ARIAS, LUIZ NEI  
Rua Lauro Muller, 116 - 109 andar  
Botafogo  
22290-160 - Rio de Janeiro - RJ  
Brazil

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

BR

State (that is, country) of residence:

BR

This person is applicant for the purposes of:

☐ all designated States

☐ all designated States except the United States of America

☒ the United States of America only

☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

ARIAS, MARJORIE  
Rua Lauro Muller, 116 - 109 andar  
Botafogo  
22290-160 - Rio de Janeiro - RJ  
Brazil

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

BR

State (that is, country) of residence:

BR

This person is applicant for the purposes of:

☐ all designated States

☐ all designated States except the United States of America

☒ the United States of America only

☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

PROVENZANO, MARIO ITALO  
Rua Lauro Muller, 116 - 109 andar  
Botafogo  
22290-160 - Rio de Janeiro - RJ  
Brazil

This person is:

- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

BR

State (that is, country) of residence:

BR

This person is applicant for the purposes of:

☐ all designated States

☐ all designated States except the United States of America

☒ the United States of America only

☐ the States indicated in the Supplemental Box

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

This person is:

- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:

State (that is, country) of residence:

This person is applicant for the purposes of:

☐ all designated States

☐ all designated States except the United States of America

☐ the United States of America only

☐ the States indicated in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.

## Box No.V DESIGNATION OF STATES

The following designations are here made under Rule 4.9(a) (mark the applicable check-boxes, at least one must be marked):

## Regional Patent

- ☒ AP ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SL Sierra Leone, SZ Swaziland, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ EA Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ EP European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ OA OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line) .....

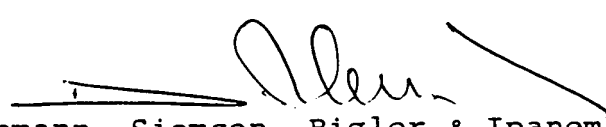
## National Patent (if other kind of protection or treatment desired, specify on dotted line):

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> AE United Arab Emirates                  | <input checked="" type="checkbox"/> LR Liberia                                   |
| <input checked="" type="checkbox"/> AL Albania                               | <input checked="" type="checkbox"/> LS Lesotho                                   |
| <input checked="" type="checkbox"/> AM Armenia                               | <input checked="" type="checkbox"/> LT Lithuania                                 |
| <input checked="" type="checkbox"/> AT Austria                               | <input checked="" type="checkbox"/> LU Luxembourg                                |
| <input checked="" type="checkbox"/> AU Australia                             | <input checked="" type="checkbox"/> LV Latvia                                    |
| <input checked="" type="checkbox"/> AZ Azerbaijan                            | <input checked="" type="checkbox"/> MD Republic of Moldova                       |
| <input checked="" type="checkbox"/> BA Bosnia and Herzegovina                | <input checked="" type="checkbox"/> MG Madagascar                                |
| <input checked="" type="checkbox"/> BB Barbados                              | <input checked="" type="checkbox"/> MK The former Yugoslav Republic of Macedonia |
| <input checked="" type="checkbox"/> BG Bulgaria                              |  |
| <input type="checkbox"/> BR Brazil   | <input checked="" type="checkbox"/> MN Mongolia                                  |
| <input checked="" type="checkbox"/> BY Belarus                               | <input checked="" type="checkbox"/> MW Malawi                                    |
| <input checked="" type="checkbox"/> CA Canada                                | <input checked="" type="checkbox"/> MX Mexico                                    |
| <input checked="" type="checkbox"/> CH and LI Switzerland and Liechtenstein  | <input checked="" type="checkbox"/> NO Norway                                    |
| <input checked="" type="checkbox"/> CN China                                 | <input checked="" type="checkbox"/> NZ New Zealand                               |
| <input checked="" type="checkbox"/> CU Cuba                                  | <input checked="" type="checkbox"/> PL Poland                                    |
| <input checked="" type="checkbox"/> CZ Czech Republic                        | <input checked="" type="checkbox"/> PT Portugal                                  |
| <input checked="" type="checkbox"/> DE Germany                               | <input checked="" type="checkbox"/> RO Romania                                   |
| <input checked="" type="checkbox"/> DK Denmark                               | <input checked="" type="checkbox"/> RU Russian Federation                        |
| <input checked="" type="checkbox"/> EE Estonia                               | <input checked="" type="checkbox"/> SD Sudan                                     |
| <input checked="" type="checkbox"/> ES Spain                                 | <input checked="" type="checkbox"/> SE Sweden                                    |
| <input checked="" type="checkbox"/> FI Finland                               | <input checked="" type="checkbox"/> SG Singapore                                 |
| <input checked="" type="checkbox"/> GB United Kingdom                        | <input checked="" type="checkbox"/> SI Slovenia                                  |
| <input checked="" type="checkbox"/> GD Grenada                               | <input checked="" type="checkbox"/> SK Slovakia                                  |
| <input checked="" type="checkbox"/> GE Georgia                               | <input checked="" type="checkbox"/> SL Sierra Leone                              |
| <input checked="" type="checkbox"/> GH Ghana                                 | <input checked="" type="checkbox"/> TJ Tajikistan                                |
| <input checked="" type="checkbox"/> GM Gambia                                | <input checked="" type="checkbox"/> TM Turkmenistan                              |
| <input checked="" type="checkbox"/> HR Croatia                               | <input checked="" type="checkbox"/> TR Turkey                                    |
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| <input checked="" type="checkbox"/> IL Israel                                | <input checked="" type="checkbox"/> UG Uganda                                    |
| <input checked="" type="checkbox"/> IN India                                 | <input checked="" type="checkbox"/> US United States of America                  |
| <input checked="" type="checkbox"/> IS Iceland                               |  |
| <input checked="" type="checkbox"/> JP Japan                                 | <input checked="" type="checkbox"/> UZ Uzbekistan                                |
| <input checked="" type="checkbox"/> KE Kenya                                 | <input checked="" type="checkbox"/> VN Viet Nam                                  |
| <input checked="" type="checkbox"/> KG Kyrgyzstan                            | <input checked="" type="checkbox"/> YU Yugoslavia                                |
| <input checked="" type="checkbox"/> KP Democratic People's Republic of Korea | <input checked="" type="checkbox"/> ZA South Africa                              |
|  | <input checked="" type="checkbox"/> ZW Zimbabwe                                  |

Check-boxes reserved for designating States which have become party to the PCT after issuance of this sheet:

- ☐ .....
- ☐ .....

**Precautionary Designation Statement:** In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)

Box No. VI PRIORITY CLAIMS		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application: regional Office	international application: receiving Office
item (1) 21 September 1998 (21.09.98)	PI 9803946-6	BR		
item (2) 19 April 1999 (19.04.99)	PI 9901906-0	BR		
item (3)				
<input checked="" type="checkbox"/> The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s): <b>1 and 2</b>				
<i>* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.</i>				
Box No. VII INTERNATIONAL SEARCHING AUTHORITY				
Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):		Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):		
ISA / EPO		Date (day/month/year)      Number      Country (or regional Office)		
Box No. VIII CHECK LIST; LANGUAGE OF FILING				
This international application contains the following number of sheets:		This international application is accompanied by the item(s) marked below:		
request : 4		1. <input checked="" type="checkbox"/> fee calculation sheet		
description (excluding sequence listing part) : 11		2. <input checked="" type="checkbox"/> separate signed power of attorney		
claims : 4		3. <input type="checkbox"/> copy of general power of attorney; reference number, if any:		
abstract : 1		4. <input type="checkbox"/> statement explaining lack of signature		
drawings : -		5. <input type="checkbox"/> priority document(s) identified in Box No. VI as item(s):		
sequence listing part of description : -		6. <input type="checkbox"/> translation of international application into (language):		
Total number of sheets : 20		7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material		
		8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form		
		9. <input checked="" type="checkbox"/> other (specify): inventors' assignment		
Figure of the drawings which should accompany the abstract:		Language of filing of the international application: English		
Box No. IX SIGNATURE OF APPLICANT OR AGENT				
Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).				
 Dannemann, Siemsen, Bigler & Ipanema Moreira				

For receiving Office use only		2. Drawings:  <input type="checkbox"/> received:  <input type="checkbox"/> not received:
1. Date of actual receipt of the purported international application:	SET 1999 21-9-99	
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent): ISA /	6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.	

For International Bureau use only
Date of receipt of the record copy by the International Bureau:

## PATENT COOPERATION TREATY

TFN

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

DANNEMANN, SIEMSEN, BIGLER &  
IPANEMA MOREIRA  
Caixa Postal 2142  
Rua Marques de Olinda 70  
22251-040 - Rio de Janeiro - RJ  
BRESIL

PCT

NOTIFICATION OF TRANSMITTAL  
OF  
THE INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing  
(day/month/year)

10.10.2000

Applicant's or agent's file reference  
PE-3695

## IMPORTANT NOTIFICATION

International application No.  
PCT/BR99/00079International filing date (day/month/year)  
21/09/1999Priority date (day/month/year)  
21/09/1998

Applicant

IBF IND STRIA BRASILEIRA DE FILMES S/A et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

## 4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/



European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0 Tx: 523656 epmu d  
Fax: +49 89 2399 - 4465

Authorized officer

Magliano, D

Tel. +49 89 2399-2245

*leaves*

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>PE-3695</b>		<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. <b>PCT/BR99/00079</b>	International filing date (day/month/year) <b>21/09/1999</b>	Priority date (day/month/year) <b>21/09/1998</b>	
International Patent Classification (IPC) or national classification and IPC <b>G03F7/004</b>			
Applicant <b>IBF IND STRIA BRASILEIRA DE FILMES S/A et al.</b>			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.


2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  <b>20/04/2000</b>	Date of completion of this report  <b>10.10.2000</b>
Name and mailing address of the international preliminary examining authority:   <b>European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465</b>	Authorized officer  <b>Randez Garcia, F</b>  Telephone No. <b>+49 89 2399 2234</b>



# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/BR99/00079

## I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*:

### Description, pages:

1,3-11	as originally filed		
2	as received on	19/09/2000	with letter of 18/09/2000

### Claims, No.:

1-6	as originally filed		
7-22	as received on	19/09/2000	with letter of 18/09/2000

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Yes:	Claims 1-22
	No:	Claims
Inventive step (IS)	Yes:	Claims 1-22
	No:	Claims
Industrial applicability (IA)	Yes:	Claims 1-22
	No:	Claims

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

Int mational application No. PCT/BR99/00079

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**2. Citations and explanations**

**see separate sheet**



**Re Item V**

**Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

- 1). None of the documents mentioned in the International Search Report discloses a radiation sensitive composition as the one claimed in claim 1.

Thus, the composition according to US-A-5,601,961 does not comprise an infrared absorbing compound nor a stabilising agent.

EP-A-0 501 433 teaches radiation-sensitive compositions which contain a dual polymer binder system, ethylenically-unsaturated monomer and a photoinitiator system. However, it does not disclose acid generating compounds. Carbon black is mentioned therein as a suitable pigment, but its properties as infrared absorber are not indicated.

- 2). For those reasons, the composition according to claim 1, its use according to claim 15, a lithographic printing plate according to claim 16 and a process for printing or image development according to claim 17, have not been anticipated by the prior art documents considered.
- 3). Moreover, the idea of using an IR-absorber to increase the temperature of the exposed regions and, thus, produce the release of acid in those regions, has not been suggested in the considered prior art documents. Therefore, an inventive step can be recognised in the subject-matter of claims 1 and 15 to 17.
- 4). The remaining claims are particular embodiments of the inventive ideas contained in claims 1 and 15 to 17.

### Detailed Description of the Invention

The radiation sensitive compositions of the present invention for coating substrates comprise 1) a dual polymer binder system, 2) an infrared absorbing compound, 3) an acid generating compound, and, optionally, 4) a stabilizing add.

#### 6 1. Dual polymer binder system

The first polymer of the binder system is a condensation product of phenol, o-chlorophenol, o-, m- or p-cresol, p-hydroxy benzoic acid, 2-naphthol or other monohydroxy aromatic monomer with an aldehyde such as formaldehyde, acetaldehyde, fural, benzaldehyde, or any other aliphatic or aromatic aldehyde. This polymer is preferred to have  
10 a molecular weight in the range from 2,000 to 80,000, more preferably in the range from 4,000 to 40,000, and most preferably in the range from 7,000 to 20,000.

The second polymer of the system is the condensation product of catechol, resorcinol, hydroquinone, bisphenol A, bisphenol B, trihydroxybenzene, or other di- or polyhydroxy aromatic compound, and methylolated analogs thereof, with an aldehyde such  
15 as formaldehyde, acetaldehyde, fural, benzaldehyde, or any other aliphatic or aromatic aldehyde. This polymer is preferred to have a molecular weight in the range from 150 to 15,000, more preferably in the range from 400 to 10,000, and most preferably in the range from 800 to 4,000.

#### 2. Infrared absorbing compound

20 The infrared absorber may be either a dye or insoluble material such as carbon black. Preferred dyes are those derived from classes that include, but not limited to pyridyl, quinoliny, benzoxazolyl, thiazolyl, benzothiazolyl, oxazolyl and selenazolyl. Carbon black is useful in that it is a panchromatic absorber and functions well with energy sources in the full spectrum of infrared useful for the application of imaging coating films, and is  
25 inexpensive and readily available. This region begins in the near infrared (NIR) at 750 nm and goes up to 1200 nm. The disadvantage of carbon black is the inability to participate in image differentiation. Dyes, in comparison, are just beginning to arise as commercial products, and are very expensive. They must be carefully selected so that the absorption  $\lambda_{max}$  (lambda maximum) is closely matched with the output wavelength of the laser used on  
30 the image setter. Dyes will advantageously enhance the differentiation between the image and non-image areas created when the laser images in the medium being employed.

19-09-2000

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7. A composition according to claim 6, wherein the onium salt comprises sulfonium, sulfoxonium, arsonium, iodonium, diazonium, bromonium, selenonium and phosphonium.

8. A composition according to claim 6 or 7, wherein the anion, which determines the released free acid, includes chloride, bisulfate, hexafluoroantimonate, hexafluorophosphate, tetrafluoroborate, methane sulfonate and mesitylene sulfonate.

9. A composition according to claim 6 or 7, wherein the onium salt is diphenyliodonium hexafluorophosphate or 3-methoxy-4-diazodiphenylamine hexafluorophosphate.

10. A composition according to claim 1, wherein the stabilizing acid is a carboxylic acid.

11. A composition according to claim 10, wherein the stabilizing acid is an aromatic carboxylic acid.

12. A composition according to claim 11, wherein the stabilizing acid is a benzoic acid or a substitute thereof or a naphthoic acid or a substitute thereof.

13. A composition according to any of the preceding claims, wherein it comprises the use as in the write-the-background mode and as in the write-the-image mode:

1. Write-the-background mode

dual polymer binder,

20	* polyphenolic	50 - 95%
	* polyhydric	5.0 - 40%
	Infrared absorber	0.1 - 12%
	acid generator	0.1 - 12%
	stabilizing acid (optional)	0.1 - 10%

25 2. Write-the-image mode

dual polymer binder,

* polyphenolic	5 - 95%
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AMENDED SHEET

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-14-

* polyhydric	10 - 90%
Infrared absorber	0.1 - 12%
acid generator	0.1 - 15%
stabilizing acid (optional)	0.1 - 10%

5

14. A composition according to claim 13, wherein it comprises the use as in the write-the-background mode and as in the write-the-image mode:

## 1A. Write-the-background mode

## COMPOSITION A COMPOSITION B

dual polymer binder,

10

* polyphenolic	60 - 90%	60 - 95%
* polyhydric	5 - 35%	10 - 40%
Infrared absorber	0.5 - 12%	0.1 - 10%
acid generator	0.5 - 12%	0.1 - 10%
stabilizing acid	0.1 - 10%	0.1 - 10%

15

## 2A. Write-the-image mode

## COMPOSITION A' COMPOSITION B'

dual polymer binder,

20

* polyphenolic	5 - 40%	60 - 95%
* polyhydric	40 - 90%	10 - 40%
Infrared absorber	0.5 - 12%	0.1 - 10%
acid generator	1.0 - 15%	0.1 - 10%
stabilizing acid	0.1 - 10%	0.1 - 10%

15. The use of a radiation sensitive composition as defined in any of the

AMENDED SHEET

- 15 -

claims 1 to 14, wherein it is used for coating substrates, particularly lithographic printing plates and in color proofing films or photoresist applications.

16. A lithographic printing plate, wherein it comprises a coating prepared from a composition according to any claims 1 - 14.

5 17. A process for printing or image development, wherein said process comprises the use of a composition as defined in any of claims 1 - 14, for forming a coating upon a support and developing an image from the support coated with said composition.

10 18. A process according to claim 17, wherein it is applied to a lithographic printing plate and said plate is subjected to a heat treatment after imaging and prior to development.

19. Process according to claim 17 or 18, wherein it is applied to a lithographic printing plate and said plate is subjected to cure after development.

20. Process according to any of the preceding claims, wherein the composition is dissolved in an appropriate solvent system.

15 21. Process according to any of the preceding claims, wherein the composition is applied to provide a coating having a dry weight in the range from 1.5 g/m<sup>2</sup> to 3.0 g/m<sup>2</sup>.

20 22. Process according to any of the preceding claims, wherein the composition is applied to provide a coating on a textured and anodized aluminum substrate or on a polyester substrate.

AMENDED SHEET

-16-

### Abstract

5 The invention relates to a composition, which is primarily energy sensitive in the near infrared and infrared region, and which comprises a dual polymer system, an infrared absorbing material that absorbs at the desired wavelength, an acid generating compound, and, optionally, an acid stabilizing compound. The composition may be applied to the proper substrate and is useful to provide offset lithographic printing plates, color proofing film or photoresist.

AMENDED SHEET

# PATENT COOPERATION TREATY

From the:  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

DANNEMANN, SIEMSEN, BIGLER &  
IPANEMA MOREIRA  
Caixa Postal 2142  
Rua Marques de Olinda 70  
22251-040 - Rio de Janeiro - RJ  
BRESIL

**PCT**

WRITTEN OPINION

(PCT Rule 66)

Date of mailing  
(day/month/year) 18.08.2000

Applicant's or agent's file reference  
PE-3695

**REPLY DUE** within 3 month(s)  
from the above date of mailing

International application No.  
PCT/BR99/00079

International filing date (day/month/year)  
21/09/1999

Priority date (day/month/year)  
21/09/1998

International Patent Classification (IPC) or both national classification and IPC  
G03F7/004

Applicant

IBF IND STRIA BRASILEIRA DE FILMES S/A et al.

1. This written opinion is the **first** drawn up by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☐ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain document cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

3. The applicant is hereby **invited to reply** to this opinion.

**When?** See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

**How?** By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

**Also:** For an additional opportunity to submit amendments, see Rule 66.4.  
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.  
For an informal communication with the examiner, see Rule 66.6.

**If no reply is filed**, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 21/01/2001.

Name and mailing address of the international preliminary examining authority:

 European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0 Tx: 523656 epmu d  
Fax: +49 89 2399 - 4465

Authorized officer / Examiner

Randez Garcia, F

Formalities officer (incl. extension of time limits)  
Schuster-Kaechele, W  
Telephone No. +49 89 2399 2281



*lembos*

## WRITTEN OPINION

International application No. PCT/BR99/00079

### I. Basis of the opinion

1. This opinion has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"*):

#### Description, pages:

1-11 as originally filed

#### Claims, No.:

1-25 as originally filed

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

3. This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

### VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**



**Re Item VIII**

**Certain observations on the international application**

- 1). The characterising features in the product claims 13-18 relate to a method of using the composition rather than clearly defining the composition in terms of its technical features. The intended limitations are therefore not clear from these claims, contrary to the requirements of Article 6 PCT.
- 2). The description is not in conformity with the claims as required by Rule 5.1(a)(iii) PCT. Thus, the summary of the invention does not specify that the stabilising acid is optional, whereas claim 1 and the detailed description of the invention make clear that this compound is merely optional.
- 3). Claims 19 and 25 contain references to the description. According to Rule 6.2(a) PCT, claims should not contain such references except where absolutely necessary, which is not the case here.
- 4). Claim 21 describes two pairs of compositions called A, B, A' and B'. While it is clear that the first pair differs from the second in the way they are used, i.e. write-the-background mode vs. write-the-image mode, the relationship between compositions A and B, or between compositions A' and B', is not clear. The Applicant should clarify if some of these compositions are more preferred than the others, or if there is another kind of relationship between them.

The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/ EPO

# PCT

## CHAPTER II

### DEMAND

under Article 31 of the Patent Cooperation Treaty:  
The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only	
Identification of IPEA	Date of receipt of DEMAND
<b>Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION</b>	
Applicant's or agent's file reference PE-3695	
International application No. PCT/BR99/00079	International filing date (day/month/year) 21 September 1999 (21.09.99)
(Earliest) Priority date (day/month/year) 21 September 1988 19 April 1999	
Title of invention "Radiation sensitive coating composition useful for lithographic printing plates and the like"	
<b>Box No. II APPLICANT(S)</b>	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) IBF INDÚSTRIA BRASILEIRA DE FILMES S/A. Rua Lauro Muller, 116 - 10º andar Botafogo 22290-160 - Rio de Janeiro - RJ Brazil	Telephone No.: (21) 541-1149
	Facsimile No.: (21) 541-0288
	Teleprinter No.:
State (that is, country) of nationality: BR	State (that is, country) of residence: BR
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) ARIAS, ANDRE LUIZ Rua Lauro Muller, 116 - 10º andar Botafogo 22290-160 - Rio de Janeiro - RJ Brazil	
State (that is, country) of nationality: BR	State (that is, country) of residence: BR
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) ARIAS, LUIZ NEI Rua Lauro Muller, 116, 10º andar Botafogo 22290-160 - Rio de Janeiro - RJ Brazil	
State (that is, country) of nationality: BR	State (that is, country) of residence: BR
<input checked="" type="checkbox"/> Further applicants are indicated on a continuation sheet.	

## Continuation of Box No. II APPLICANT(S)

*If none of the following sub-boxes is used, this sheet should not be included in the demand.*

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

ARIAS, MARJORIE  
Rua Lauro Muller, 116 - 10º andar  
Botafogo  
22290-160 - Rio de Janeiro - RJ  
Brazil

State *(that is, country)* of nationality:

BR

State *(that is, country)* of residence:

BR

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

PROVENZANO, MARIO ITALO  
Rua Lauro Muller, 116 - 10º andar  
Botafogo  
22290-160 - Rio de Janeiro - RJ  
Brazil

State *(that is, country)* of nationality:

BR

State *(that is, country)* of residence:

BR

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

State *(that is, country)* of nationality:

State *(that is, country)* of residence:

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

State *(that is, country)* of nationality:

State *(that is, country)* of residence:

☐ Further applicants are indicated on another continuation sheet.

**Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE**The following person is ☒ agent ☐ common representativeand ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*DANNEMANN, SIEMSEN, BIGLER & IPANEMA MOREIRA  
Caixa Postal 2142  
Rua Marquês de Olinda, 70  
Botafogo  
22251-040 - Rio de Janeiro - RJ  
Brazil

Telephone No.:

(21) 553-1811

Facsimile No.:

(21) 553-1812  
553-1813

Teleprinter No.:

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.**Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION****Statement concerning amendments:\***

1. The applicant wishes the international preliminary examination to start on the basis of:

☒ the international application as originally filedthe description ☒ as originally filed☐ as amended under Article 34the claims ☒ as originally filed☐ as amended under Article 19 (together with any accompanying statement)☐ as amended under Article 34the drawings ☐ as originally filed☐ as amended under Article 342. ☐ The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.3. ☐ The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). *(This check-box may be marked only where the time limit under Article 19 has not yet expired.)*

\* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: English

☒ which is the language in which the international application was filed.☐ which is the language of a translation furnished for the purposes of international search.☐ which is the language of publication of the international application.☐ which is the language of the translation (to be) furnished for the purposes of international preliminary examination.**Box No. V ELECTION OF STATES**The applicant hereby elects all eligible States *(that is, all States which have been designated and which are bound by Chapter II of the PCT)*

excluding the following States which the applicant wishes not to elect:

## Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

- |  |   |        |
|--|---|--------|
| 1. translation of international application                              | : | sheets |
| 2. amendments under Article 34   | : | sheets |
| 3. copy (or, where required, translation) of amendments under Article 19 | : | sheets |
| 4. copy (or, where required, translation) of statement under Article 19  | : | sheets |
| 5. letter  | : | sheets |
| 6. other (specify)   | : | sheets |

For International Preliminary  
Examining Authority use only

received                      not received


<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

The demand is also accompanied by the item(s) marked below:

- |  |   |
|--|---|
| 1. <input checked="" type="checkbox"/> fee calculation sheet                             | 4. <input type="checkbox"/> statement explaining lack of signature                                  |
| 2. <input type="checkbox"/> separate signed power of attorney                            | 5. <input type="checkbox"/> nucleotide and or amino acid sequence listing in computer readable form |
| 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: | 6. <input type="checkbox"/> other (specify):  |

## Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).

  
Dannemann, Siemsen, Bigler & Ipanema Moreira

For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply.

☐ The applicant has been informed accordingly.

4. ☐ The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.

5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

For International Bureau use only

Demand received from IPEA on:

## PCT

## FEE CALCULATION SHEET

Annex to the Demand for international preliminary examination

International application No. <b>PCT/BR99/00079</b>	For International Preliminary Examining Authority use only	
Applicant's or agent's file reference <b>PE-3695</b>	Date stamp of the IPEA	
Applicant <b>IBF INDÚSTRIA BRASILEIRA DE FILMES S/A. et al</b>		
<b>Calculation of prescribed fees</b>		
1. Preliminary examination fee .....	DM    749,58	P
2. Handling fee <i>(Applicants from certain States are entitled to a reduction of 75% of the handling fee. Where the applicant is (or all applicants are) so entitled, the amount to be entered at H is 25% of the handling fee.)</i> .....	DM    287,51	H
3. Total of prescribed fees Add the amounts entered at P and H and enter total in the TOTAL box .....	DM 1.037,09	
TOTAL		
<b>Mode of Payment</b>		
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <input type="checkbox"/> authorization to charge deposit account with the IPEA (see below)         </div> <div style="width: 45%;"> <input type="checkbox"/> cash         </div> </div>		
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <input type="checkbox"/> cheque         </div> <div style="width: 45%;"> <input type="checkbox"/> revenue stamps         </div> </div>		
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <input type="checkbox"/> postal money order         </div> <div style="width: 45%;"> <input type="checkbox"/> coupons         </div> </div>		
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <input checked="" type="checkbox"/> bank draft         </div> <div style="width: 45%;"> <input type="checkbox"/> other (specify):         </div> </div>		
<b>Deposit Account Authorization</b> <i>(this mode of payment may not be available at all IPEAs)</i>		
The IPEA/ _____ <input type="checkbox"/> is hereby authorized to charge the total fees indicated above to my deposit account.		
<input type="checkbox"/> <i>(this check-box may be marked only if the conditions for deposit accounts of the IPEA so permit)</i> is hereby authorized to charge any deficiency or credit any overpayment in the total fees indicated above to my deposit account.		
Deposit Account Number	Date (day/month/year)	Signature

# PATENT COOPERATION TREATY

DANNEMANN, SIEMSEN  
GIGLET MOREIRA

29 FEB 03 PCT

From the INTERNATIONAL SEARCHING AUTHORITY

To:  
DANNEMANN, SIEMSEN, BIGLER  
& IPANEMA MOREIRA  
Attn. DANNEMANN, SIEMSEN  
Rua Marquês de Olinda, 70  
Botafogo  
22251-040 - Rio de Janeiro - RJ  
BRAZIL

## NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing (day/month/year)	22/02/2000
Applicant's or agent's file reference PE-3695	<b>FOR FURTHER ACTION</b> See paragraphs 1 and 4 below
International application No. PCT/BR 99/ 00079	International filing date (day/month/year) 21/09/1999
Applicant IBF IND STRIA BRASILEIRA DE FILMES S/A et al.	

1. ☒ The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

### Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

**When?** The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

**Where?** Directly to the International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland  
Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after 18 months from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within 19 months from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within 20 months from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority



European Patent Office, P.B. 5818 Patentlaan 2  
NL-2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
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Authorized officer

Nathalie Ostwinkel

*leaver*

## NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

### INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

#### What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

#### When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

#### Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

#### How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

**The amendments must be made in the language in which the international application is to be published.**

#### What documents must/may accompany the amendments?

##### Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

**The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.**



The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:  
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:  
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:  
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or  
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:  
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

#### "Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

**It must be in the language in which the international application is to be published.**

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

#### Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the procedure before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/PEA/401).

#### Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>PE-3695</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/BR 99/00079</b>	International filing date (day/month/year) <b>21/09/1999</b>	(Earliest) Priority Date (day/month/year) <b>21/09/1998</b>
Applicant <b>IBF INDUSTRIA BRASILEIRA DE FILMES S/A et al.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 2 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. ----



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.



None of the figures.

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>PE-3695</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/BR 99/00079</b>	International filing date (day/month/year) <b>21/09/1999</b>	(Earliest) Priority Date (day/month/year) <b>21/09/1998</b>
Applicant <b>IBF IND STRIA BRASILEIRA DE FILMES S/A et al.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 2 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing :



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (see Box II).

## 4. With regard to the title,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

## 5. With regard to the abstract,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.



None of the figures.

## INTERNATIONAL SEARCH REPORT

International application No.

/BR 99/00079

## A. CLASSIFICATION OF SUBJECT MATTER

IPC7: G03F 7/004, C08G 4/00, C08G 8/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: C08G, G03F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

QUESTEL: EDOC, WPIL, JAPIO

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5601961 A (KAZUHIKO NAKAYAMA ET AL), 11 February 1997 (11.02.97), column 2, line 66 - column 3, line 47; column 10, line 49 - line 59; column 11, line 8 - line 26 --	1,4,6,7,13, 16,22-24
Y	EP 0501433 A1 (E.I. DU PONT DE NEMOURS AND COMPANY), 2 Sept 1992 (02.09.92), page 2, line 8 - line 10; page 6, line 40 - page 7, line 14; page 16, line 51 - page 17, line 5 --	1,4,6,7,13, 16-22
A	US 4943511 A (RICHARD M. LAZARUS ET AL), 24 July 1990 (24.07.90), claim 1 -----	1-25

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

## \* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

27 January 2000

Name and mailing address of the International Searching Authority  
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Tel(+31-70)340-2040, Tx 31 651 epo nl,  
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Date of mailing of the international search report

22 02. 2000

Authorized officer

BENGT CHRISTENSSON/ELY  
Telephone No.

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

02/12/99

PCT/BR 99/00079

Patent document cited in search report			Publication date	Patent family member(s)		Publication date
US	5601961	A	11/02/97	JP	7271024 A	20/10/95
EP	0501433	A1	02/09/92	CA	2061877 A	29/08/92
				CN	1065468 A	21/10/92
				DE	69219502 D,T	11/12/97
				JP	5093003 A	16/04/93
				US	5886101 A	23/03/99
US	4943511	A	24/07/90	AT	94661 T	15/10/93
				AU	3127689 A	05/10/89
				DE	68909084 D,T	13/01/94
				DK	155289 A	01/10/89
				EP	0336605 A,B	11/10/89
				IL	89632 A	31/01/93
				JP	2010348 A	16/01/90
				JP	2042766 C	09/04/96
				JP	7078627 B	23/08/95
				KR	9401550 B	24/02/94
				NO	891062 A	02/10/89
				SG	43594 A,G	14/10/94
				US	4996122 A	26/02/91

**DANNEMANN  
SIEMSEN  
BIGLER &  
IPANEMA MOREIRA**

09/787667  
JC02 Rec'd PCT/PTO 21 MAR 2001



Code: 311878002

**PROPRIEDADE INDUSTRIAL**

EUROPEAN PATENT OFFICE  
ERHARDSTRASSE 27  
D-80298 MUENCHEN  
DE-ALEMANHA

Att.: Mr. Randez Garcia, F

Rio, September 18, 2000

**PCT CHAPTER II**

**MU DG2**

Fax: 0049 89 2399 4465

Ref.: PCT - International patent application no. PCT/BR99/00079  
filed on September 21, 1999  
IBF INDÚSTRIA BRASILEIRA DE FILMES S/A.  
Our ref.: PE-3695 (sst)  
**REPLY TO THE WRITTEN OPINION mailed on August 18, 2000**

Dear Sirs:

In reply to the written opinion issued by the Examination Authority in the above application, new pages of the application (specification, claims and abstract) are enclosed herewith in order to transverse the objections set forth in items 1-4 of the examiner's opinion.

**Amendments in the application:**

- (i) Page 2 of the specification – line 4 – Inclusion of "optionally" before component 4; that is before the stabilizing acid;
- (ii) removal of initial composition claims 13-18;
- (iii) removal of claims 19 and 25;
- (iv) addition of new dependent process claims 18-22 with the subject matter of former composition claims 14-18.
- (v) initial claims 20-24 were duly renumbered as new claims 13-17 as a result of the deletion of the above claims 13-18, 19 and 25;
- (vi) amendment of the dependency of former claim 21 (New claim 14) to depend on former claim 20 (New claim 13);
- (vii) abstract – Inclusion of "optionally" before the stabilizing acid.

The above amendments clearly define the stabilising acid as an optional component in page 2 of the specification and abstract. Several other passages of the application state that this component is optional. Former composition claims 14-18 were replaced with new dependent process claims 18-22 since the features disclosed therein are related to process features rather than composition features as indicated in item 1) of the written opinion. In order to comply with item 3) of the written opinion, claims 19 and 25 were removed.

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1900 100 ANOS 2000

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MANUELA ROMANA GOMES CARNEIRO  
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## PROPRIEDADE INDUSTRIAL

Regarding item 4) of the written opinion, the former Claim 21 (new claim 14) discloses two specific types of **each** composition defined in former claim 20 (new claim 13). That is, compositions 1A and 2A of new claim 14 are specific cases of compositions 1 and 2, respectively, disclosed in the new composition claim 13 (former claim 20). New claim 14 now depends on claim 13 to clearly show that particular compositions are disclosed in claim 14.

The amended pages are attached.

We believe that all points of the written opinion were clarified and kindly request the issuance of the final preliminary examination report based on the enclosed amended pages.

Very truly yours,

Carlos Cezar Cordeiro Pires  
(Agent for the applicant)

## Detailed Description of the Invention

The radiation sensitive compositions of the present invention for coating substrates comprise 1) a dual polymer binder system, 2) an infrared absorbing compound, 3) an acid generating compound, and, optionally, 4) a stabilizing acid.

### 5                    1. Dual polymer binder system

The first polymer of the binder system is a condensation product of phenol, o-chlorophenol, o-, m- or p-cresol, p-hydroxy benzoic acid, 2-naphthol or other monohydroxy aromatic monomer with an aldehyde such as formaldehyde, acetaldehyde, fural, benzaldehyde, or any other aliphatic or aromatic aldehyde. This polymer is preferred to have  
10 a molecular weight in the range from 2,000 to 80,000, more preferably in the range from 4,000 to 40,000, and most preferably in the range from 7,000 to 20,000.

The second polymer of the system is the condensation product of catechol, resorcinol, hydroquinone, bisphenol A, bisphenol B, trihydroxybenzene, or other di- or polyhydroxy aromatic compound, and methylolated analogs thereof, with an aldehyde such  
15 as formaldehyde, acetaldehyde, fural, benzaldehyde, or any other aliphatic or aromatic aldehyde. This polymer is preferred to have a molecular weight in the range from 150 to 15,000, more preferably in the range from 400 to 10,000, and most preferably in the range from 600 to 4,000.

### 2. Infrared absorbing compound

The infrared absorber may be either a dye or insoluble material such as carbon black. Preferred dyes are those derived from classes that include, but not limited to pyridyl, quinolinyl, benzoxazolyl, thiazolyl, benzothiazolyl, oxazolyl and selenazolyl. Carbon black is useful in that it is a panchromatic absorber and functions well with energy sources in the full spectrum of infrared useful for the application of imaging coating films, and is  
20 inexpensive and readily available. This region begins in the near infrared (NIR) at 750 nm and goes up to 1200 nm. The disadvantage of carbon black is the inability to participate in image differentiation. Dyes, in comparison, are just beginning to arise as commercial products, and are very expensive. They must be carefully selected so that the absorption  $\lambda_{\text{max}}$  (lambda maximum) is closely matched with the output wavelength of the laser used on  
25 the image setter. Dyes will advantageously enhance the differentiation between the image and non-image areas created when the laser images in the medium being employed.  
30



7. A composition according to claim 6, wherein the onium salt comprises sulfonium, sulfoxonium, arsonium, iodonium, diazonium, bromonium, selenonium and phosphonium.

5 8. A composition according to claim 6 or 7, wherein the anion, which determines the released free acid, includes chloride, bisulfate, hexafluoroantimonate, hexafluorophosphate, tetrafluoroborate, methane sulfonate and mesitylene sulfonate.

9. A composition according to claim 6 or 7, wherein the onium salt is diphenyliodonium hexafluorophosphate or 3-methoxy-4-diazodiphenylamine hexafluorophosphate.

10 10. A composition according to claim 1, wherein the stabilizing acid is a carboxylic acid.

11. A composition according to claim 10, wherein the stabilizing acid is an aromatic carboxylic acid.

15 12. A composition according to claim 11, wherein the stabilizing acid is a benzoic acid or a substitute thereof or a naphthoic acid or a substitute thereof.

13. A composition according to any of the preceding claims, wherein it comprises the use as in the write-the-background mode and as in the write-the-image mode:

**1. Write-the-background mode**

dual polymer binder,

20	* polyphenolic	50 - 95%
	* polyhydric	5.0 - 40%
	infrared absorber	0.1 - 12%
	acid generator	0.1 - 12%
	stabilizing acid (optional)	0.1 - 10%

25 **2. Write-the-image mode**

dual polymer binder,

* polyphenolic	5 - 95%
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* polyhydric	10 - 90%
infrared absorber	0.1 - 12%
acid generator	0.1 - 15%
stabilizing acid (optional)	0.1 - 10%

- 5                    14. A composition according to claim 13, wherein it comprises the use as in the write-the-background mode and as in the write-the-image mode:

**1A. Write-the-background mode**

		<b>COMPOSITION A</b>	<b>COMPOSITION B</b>
	dual polymer binder,		
10	* polyphenolic	50 - 90%	60 - 95%
	* polyhydric	5 - 35%	10 - 40%
	infrared absorber	0.5 - 12%	0.1 - 10%
	acid generator	0.5 - 12%	0.1 - 10%
	stabilizing acid	0.1 - 10%	0.1 - 10%

15                    **2A. Write-the-image mode**

		<b>COMPOSITION A'</b>	<b>COMPOSITION B'</b>
	dual polymer binder,		
	* polyphenolic	5 - 40%	60 - 95%
	* polyhydric	40 - 90%	10 - 40%
20	infrared absorber	0.5 - 12%	0.1 - 10%
	acid generator	1.0 - 15%	0.1 - 10%
	stabilizing acid	0.1 - 10%	0.1 - 10%

15. The use of a radiation sensitive composition as defined in any of the

claims 1 to 14, wherein it is used for coating substrates, particularly lithographic printing plates and in color proofing films or photoresist applications.

16. A lithographic printing plate, wherein it comprises a coating prepared from a composition according to any claims 1 - 14.

5           17. A process for printing or image development, wherein said process comprises the use of a composition as defined in any of claims 1 - 14, for forming a coating upon a support and developing an image from the support coated with said composition.

10           18. A process according to claim 17, wherein it is applied to a lithographic printing plate and said plate is subjected to a heat treatment after imaging and prior to development.

19. Process according to claim 17 or 18, wherein it is applied to a lithographic printing plate and said plate is subjected to cure after development.

20. Process according to any of the preceding claims, wherein the composition is dissolved in an appropriate solvent system.

15           21. Process according to any of the preceding claims, wherein the composition is applied to provide a coating having a dry weight in the range from 1.5 g/m<sup>2</sup> to 3.0 g/m<sup>2</sup>.

20           22. Process according to any of the preceding claims, wherein the composition is applied to provide a coating on a textured and anodized aluminum substrate or on a polyester substrate.

### **Abstract**

5       The invention relates to a composition, which is primarily energy sensitive in the near infrared and infrared region, and which comprises a dual polymer system, an infrared absorbing material that absorbs at the desired wavelength, an acid generating compound, and, optionally, an acid stabilizing compound. The composition may be applied to the proper substrate and is useful to provide offset lithographic printing plates, color proofing film or photoresist.